

# Commonwealth of Massachusetts Executive Office of Energy & Environmental Affairs

# Department of Environmental Protection

Central Regional Office • 8 New Bond Street, Worcester MA 01606 • 508-792-7650

Charles D. Baker Governor

Karyn E. Polito Lieutenant Governor Matthew A. Beaton Secretary

> Martin Suuberg Commissioner

March 23, 2015

Ms. Kathleen A. Puff Hollingsworth & Vose Company 219 Townsend Road West Groton, MA 01472 **RE:** Groton

Transmittal No.: X263864 Application No.: CE-14-029

Class: OP

FMF No.: 131591

AIR QUALITY PLAN APPROVAL

Dear Ms. Puff:

The Massachusetts Department of Environmental Protection ("MassDEP"), Bureau of Air and Waste, has reviewed your Non-major Comprehensive Plan Application ("Application") listed above. This Application concerns the proposed construction and operation of a combustion turbine and duct burner at your facility located at 219 Townsend Road in Groton, Massachusetts ("Facility"). The Application bears the seal and signature of Dale T. Raczynski, Massachusetts Registered Professional Engineer Number 36207.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control" regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-O, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator ("Permittee") must comply in order for the Facility to be operated in compliance with this Plan Approval.

## 1. DESCRIPTION OF FACILITY AND APPLICATION

#### A. HISTORY

The Permittee operates the existing Facility to manufacture paper. MassDEP has issued Plan Approvals to the Permittee for emissions of Volatile Organic Compounds ("VOC") and products of combustion from existing equipment at the Facility. The Facility is subject to the Title V Operating Permit Program and its most recent Operating Permit Transmittal No. W201917 was issued by MassDEP on March 25, 2009. The Operating Permit listed five different emission units ("EUs"), designated as EU #1-5. Those five EUs remain in operation today and are not further discussed in this Plan Approval.

#### **B. PROJECT DESCRIPTION**

On November 28, 2014, MassDEP received the present Application under Transmittal No. X263864 for the installation of a new Combined Heat and Power ("CHP") project at the Facility. The CHP project consists of a maximum 4.1 megawatt Solar Centaur 40 combustion turbine with a duct fired heat recovery steam generator ("duct burner"), both of which will burn natural gas as the only fuel. The combustion turbine and duct burner will be designated as EU #6 and #7.

#### C. Aplicable Regulatory Requirements

#### 1. State Requirements

The turbine will be subject to the MassDEP Environmental Results Program (ERP) for Engines and Turbines at 310 CMR 7.26(43). The duct burner in the HRSG will be subject to the plan approval requirements of 310 CMR 7.02 since the Boiler ERP, contained in 310 CMR 7.26(30), does not apply to sources located at a facility who has secured an operating permit pursuant to 310 CMR 7.00: Appendix C.

This project is required to have Best Available Control Technology ("BACT") under 310 CMR 7.02. MassDEP has determined that BACT for this project is the emission limits specified in Table 2 below. These emission limits will be achieved by the installation of an inherently low-emitting combustion turbine followed by oxidation catalyst to control carbon monoxide (CO) and volatile organic compounds ("VOC"), and Selective Catalytic Reduction ("SCR") to control oxides of nitrogen ("NO<sub>x</sub>"). The combustion turbine is subject to 310 CMR 7.26(43) requirements for NO<sub>x</sub>, CO, CO<sub>2</sub>, and ammonia (NH<sub>3</sub>).

The Permittee is an existing major stationary source of nitrogen oxides (NO<sub>x</sub>) pursuant to the Emission Offsets and Nonattainment Review regulations of 310 CMR 7.00: Appendix A because

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the existing facility has the potential to emit more than 50 tons per year of  $NO_x$ . Therefore, the facility must calculate the net emissions increase for  $NO_x$  from the physical change/ change in the method of operation of the duct burner to determine the applicability of 310 CMR 7.00: Appendix A. The facility has demonstrated that the air contaminant emissions from the construction and operation of the CHP project will not have a significant net emission increase for  $NO_x$  and is therefore not a major modification as defined in 310 CMR 7.00: Appendix A. As a result, the project will not be subject to 310 CMR 7.00: Appendix A.

# 2. Federal Requirements

The Permittee shall comply with Federal New Source Performance Standards ("NSPS") for Combustion Turbines, 40 CFR Part 60, Subpart KKKK. The applicable test method and procedures to be used during compliance testing are stated in 40 CFR Part 60, section 60.4400.

The Permittee is an existing major source of Hazardous Air Pollutants ("HAP") and so the project is subject to 40 CFR Part 63, Subpart YYYY, National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines. Pursuant to 40 CFR 63.6095(d), the Permittee must comply with the Initial Notification requirements set forth in § 63.6145 but need not comply with any other requirement of this subpart until EPA takes final action to require compliance and publishes a document in the Federal Register.

This project will result in potential emissions increases which do not exceed the Significant Emission Rate Increases of 40 CFR 52.21 and therefore is not subject to Prevention of Significant Deterioration ("PSD") review per 40 CFR 52.21.

# 2. <u>EMISSION UNIT IDENTIFICATION</u>

Each Emission Unit ("EU") identified in Table 1 is subject to and regulated by this Plan Approval:

Table 1				
EU Description		Design Capacity	Pollution Control Device (PCD)	
6	Solar Centaur 40-4700S Combustion Gas Turbine	55.3 MMBtu/hour (HHV) 4.1 Megawatts	Oxidation Catalyst and Selective Catalytic Reduction	
7	Duct Burner	35.5 MMBtu/hour (HHV)	("SCR")	

Table 1 Key:

EU = Emission Unit Number MMBtu = Million British Thermal Units PCD = Pollution Control Device HHV = Higher Heating Value

## 3. APPLICABLE REQUIREMENTS

#### A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2:

Table 2					
EU	Operational / Production Limit	Air Contaminant	Emission Limit (Note 1)		
6 & 7	1. Fuel Firing limited so that TPY limits are not exceeded.		Turbine + Duct Burner lb/MMBtu	Turbine + Duct Burner lb/hr	Turbine + Duct Burner TPY
		NO <sub>x</sub>	0.011	0.96	3.84
		CO	0.007	0.62	2.5
		NH <sub>3</sub>	0.0027	0.25	0.97
		PM (Note 2)	0.015	1.35	5.3
		VOC	0.0085	0.77	3.2
		SO <sub>2</sub>	0.0029	0.26	1.05
		Opacity	5% opacity (excluding water vapor) at any time		
	Carbon Dioxide Turbine only: 1650 pounds per r (Note 3)			negawatt-hour	

#### Table 2 Key:

 $EU = Emission \ Unit \ Number \\ CO = Carbon \ Monoxide \\ SO_2 = Sulfur \ Dioxide \\$ 

 $PM = Total \ Particulate \ Matter \ of \ all \ particle \ sizes, \ PM_{10} = Particulate \ Matter \ less \ than \ or \ equal \ to \ 10$  including filterable and condensable (Note 2) microns in diameter

 $PM_{2.5}$  = Particulate Matter less than or equal to 2.5 VOC = Volatile Organic Compounds

microns in diameter

TPY = tons per consecutive 12-month period lb/hr = pounds per hour

lb/MMBtu = pounds per million British Thermal Units

#### **Table 2 Notes**

**Note 1:** Compliance with the lb/MMBtu and lb/hr emission limits for  $NO_x$ , CO, VOC, PM (including  $PM_{10}$  and  $PM_{2.5}$ ),  $SO_2$  and ammonia shall be based on the results of an applicable USEPA Reference Test Method.

**Note 2:** Compliance with the PM standard shall be demonstrated using EPA Methods 5 and 202 or equivalent. It shall be assumed that all filterable PM is  $PM_{2.5}$ .

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**Note 3:** Compliance with the turbine carbon dioxide limit shall be calculated from the instantaneous fuel usage rate and the instantaneous power production rate, using an EPA emission factor for carbon dioxide.

# B. <u>COMPLIANCE DEMONSTRATION</u>

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5:

Table 3			
EU	Monitoring and Testing Requirements		
6&7	1. The Permittee shall continuously monitor the emissions of NO <sub>x</sub> , CO and oxygen as a diluent by installing, calibrating, maintaining and operating a monitoring system. Such monitoring system shall include a process NO <sub>x</sub> analyzer for control of ammonia injection, and a CO analyzer to monitor the performance of the oxidation catalyst.		
	2. The Permittee shall install and maintain instrumentation for EU6 and EU7 which is capable of continuously monitoring the ammonia injection rate for the SCR system.		
	3. The Permittee shall install and maintain instrumentation for EU6 and EU7 which is capable of continuously monitoring the exhaust gas temperature at the inlet to the oxidation catalyst and at the outlet of the SCR system.		
	4. The Permittee shall equip the continuous temperature monitoring system for the oxidation catalyst and the SCR system with audible and visible alarms which activate when these temperatures deviate from normal operating temperatures.		
	5. The Permittee shall conduct compliance testing on the combustion turbine and duct burner, while they are operating at or near design capacity, to demonstrate compliance with the emission limitations specified in Table 2 above. The Permittee shall complete all compliance testing within 180 days of initial start-up.		
	6. Pursuant to 40 CFR 60.4400 and 310 CMR 7.13, subsequent NO <sub>x</sub> and CO performance tests shall be conducted on an annual basis (no more than 14 calendar months following the previous performance test).		
	7. The exhaust stack serving the combustion turbine and duct burner shall be constructed to accommodate the emissions testing requirements as stipulated in 40 CFR Part 60, Appendix A or the latest test methods recommended by USEPA.		
	8. Not later than 150 days after initial startup of the combustion turbine and duct burner, the Permittee shall conduct sound level monitoring of the actual sound levels produced by the equipment, to verify compliance with the MassDEP noise guidelines.		
	9. The combustion turbine and duct burner shall each be equipped with a fuel meter and recorder, and all fuel usage shall be monitored.		

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Table 3					
EU	U Monitoring and Testing Requirements				
Facility- wide	10. The Permittee shall monitor all operations to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.				
	11. If and when MassDEP requires it, the Permittee shall conduct additional emission testing in accordance with USEPA Reference Test Methods and Regulation 310 CMR 7.13.				

# Table 3 Key:

EU = Emission Unit Number CO = Carbon Monoxide  $NO_x$  = Nitrogen Oxides SCR = Selective Catalytic Reduction

Table 4				
EU	Record Keeping Requirements			
6 & 7	1. The Permittee shall continuously record the emissions of NO <sub>x</sub> , CO and O <sub>2</sub> as a diluent gas.			
0 & 7	2. The Permittee shall continuously record the ammonia injection rate.			
	3. The Permittee shall continuously record the exhaust gas temperature at the inlet to the oxidation catalyst and at the outlet of the SCR system.			
	4. Each unit shall record with a fuel meter the amount of fuel combusted.			
	5. In accordance with 40 CFR 60.4365(a), the Permittee shall record the fuel quality characteristics in a current, valid purchase contract or tariff sheet for the fuel, specifying that the total sulfur content for natural gas is 20 grains of sulfur or less per 100 standard cubic feet and has potential sulfur emissions of less than 26 ng SO <sub>2</sub> /J (0.060 lb SO <sub>2</sub> /MMBtu) heat input.			
Facility- wide	6. The Permittee shall maintain adequate records on-site to demonstrate compliance status with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve-month period (current month plus prior eleven months). These records shall be compiled no later than the 15 <sup>th</sup> day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at <a href="http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping">http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping</a> .			
	7. The Permittee shall maintain records of monitoring and testing as required by Table 3.			
	8. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EU(s) and PCD(s) approved herein on-site.			

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Table 4				
EU	Record Keeping Requirements			
	9. The Permittee shall maintain a record of routine maintenance activities performed on the approved EU(s), PCD(s) and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.			
	10. The Permittee shall maintain a record of all malfunctions affecting air contaminant emission rates on the approved EU(s), PCD(s) and monitoring equipment. At a minimum, the records shall include: date and time the malfunction occurred; description of the malfunction; corrective actions taken; the date and time corrective actions were initiated and completed; and the date and time emission rates and monitoring equipment returned to compliant operation.			
	11. The Permittee shall maintain records to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.			
	12. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years.			
	13. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request.			

# Table 4 Key:

EU = Emission Unit Number SOMP = Standard Operating and Maintenance

Procedure

 $NO_x = Nitrogen Oxides$ 

 $O_2 = Oxygen$ 

SCR = Selective Catalytic Reduction

PCD = Pollution Control Device

USEPA = United States Environmental Protection

Agency

CO = Carbon Monoxide

 $SO_2 = Sulfur Dioxide$ 

ng/J = nanograms per Joule

Table 5				
EU	Reporting Requirements			
Facility- wide	1. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a "Responsible Official" as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).			
	2. The Permittee shall notify the Central Regional Office of MassDEP, BAW Permit Chief by telephone: 508-767-2845, email: Roseanna.Stanley@state.ma.us, or fax: 508-792-7621, as soon as possible, but no later than three (3) business day after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to the Permit Chief at MassDEP within ten (10) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).			
	3. The Permittee shall report annually to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form. The Permittee shall note therein any minor changes (under 310 CMR 7.02(2)(e), 7.03, 7.26, etc.), which did not require Plan Approval.			
	4. The Permittee shall submit to MassDEP for approval a stack emission pretest protocol at least 30 days prior to emission testing, for emission testing as defined in Table 3 Monitoring and Testing Requirements.			
	5. The Permittee shall submit to MassDEP a final stack emission test results report within 60 days after emission testing, for emission testing as defined in Table 3 Monitoring and Testing Requirements.			
	6. The Permittee shall submit a proposed sound monitoring protocol to MassDEP 60 days prior to the monitoring to obtain approval.			
	7. The Permittee shall submit the Sound Level Monitoring Report within 60 days of the sound monitoring required in Table 3.			

#### Table 5 Key:

EU = Emission Unit Number

BAW = Bureau of Air and Waste

# 4. SPECIAL TERMS AND CONDITIONS

A. The Permittee is subject to, and shall comply with, the Special Terms and Conditions as contained in Table 6 below:

Table 6				
EU	Special Terms and Conditions			
	1. The Permittee shall operate the oxidation catalyst and SCR at all times the turbine is operating.			
6 & 7	2. In accordance with 40 CFR Part 60.8, if the Permittee requests, MassDEP may alter the requirements for compliance determination by performance testing. The Permittee may propose alternative compliance determination methods, which may include continuous emissions monitoring systems (CEMS) or parametric monitoring systems. Such alternative methods must be approved in writing by MassDEP prior to their use instead of the Table 3 performance test requirements.			
	3. The Permittee shall operate the temperature, ammonia injection rate and emission monitoring equipment at all times that EU6 and 7 are operating, except for periods of calibration checks, zero and span adjustments, and preventive maintenance.			
	4. The Permittee shall maintain on-site for the temperature, ammonia injection rate, NO <sub>x</sub> , CO and oxygen monitoring equipment an adequate supply of spare parts.			
	5. The operating temperature for the SCR shall be within 450 °F to 800 °F.			
	6. The operating temperature for the oxidation catalyst shall be within 500 °F to 1150 °F.			
	7. The turbine shall be operated in accordance with the requirements of 310 CMR 7.26(43).			
	8. The turbine and duct burner are subject to Subpart KKKK of the federal Standards of Performance for Stationary Combustion Turbines, 40 CFR 60.4300 through 60.4420 and shall comply with the applicable requirements.			
Facility- wide	9. Any prior Plan Approvals issued under 310 CMR 7.02 shall remain in effect unless specifically changed or superseded by this Plan Approval. The Facility shall not exceed the emission limits and shall comply with approved conditions specified in the prior Plan Approval(s) unless specifically altered by this Plan Approval.			

#### Table 6 Key:

EU = Emission Unit Number SCR = Selective Catalytic Reduction F = Degree Fahrenheit

- B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including, but not limited to, rain protection devices known as "shanty caps" and "egg beaters."
- C. The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7, for the Emission Units that are regulated by this Plan Approval:

Table 7				
EU	EU Stack Height Above Ground (feet) Stack Inside Exit Dimensions		Stack Gas Exit Velocity Range (feet per second)	Stack Gas Exit Temperature Range (°F)
6 & 7	Greater than or equal to 60 feet	4 feet	35-77	175-350

Table 7 Key:

EU = Emission Unit Number

F = Degree Fahrenheit

### 5. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.
- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.
- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.

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- F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.
- I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

## 6. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain "Fail-Safe Provisions," which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

# 7. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

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# Commonwealth of Massachusetts Department of Environmental Protection P.O. Box 4062 Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Enclosed is a stamped approved copy of the application submittal.

Should you have any questions concerning this Plan Approval, please contact Paul Dwiggins by telephone at 508-767-2760, or in writing at the letterhead address.

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Roseanna E. Stanley Permit Chief Bureau of Air and Waste

#### Enclosure

ecc: Groton Board of Health

Groton Fire Department MassDEP/Boston - Yi Tian

Dale Raczynski, Epsilon Associates